

Remarks

Reconsideration and withdrawal of the Examiner's rejections are requested respectfully.

Status of the Claim

Claims 1, 7 to 13, 17, and 19 have been amended. Claim 20 has been added. No claims have been deleted. Accordingly, Claims 1 to 20 are presented for examination.

Bases in the specification for the claim amendments are as follows.

Process Claims 1 and 19 have been amended to define the coating composition as a composition which is capable of forming a corrosion-resistant coating on a metallic or ceramic surface (see page 12, last paragraph). Article Claim 7 has been amended to define the coating as corrosion-resistant (see original Claim 1). Article Claims 8 to 11 have been amended to define the metallic surface as being a steel surface and new Claim 20 is directed to coating a steel surface (see page 14, sentence preceding the paragraph bridging pages 14 and 15). Process Claim 12 has been amended to define the surface being coated as a metallic or ceramic surface and to define the coating as being corrosion-resistant (see original Claims 7 and 1); also, basis for the amendment to step (A) of Claim 12 appears in the last sentence of the paragraph bridging pages 10 and 11. Each of independent Claims 1, 7, 12, 13, 17 and 19 has been amended to define the composition or the coating as being free of hexavalent chromium (see page 10, first paragraph).

Summary of the Examiner's Rejections

Claims 1, 2, 4, 7 to 12 and 19 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,917,960 to Hornberger et al.

Claim 5 has been rejected under 35 U.S.C. § 103(a) as being obvious based on the disclosure of the aforementioned Hornberger et al. patent in view of the disclosure of U.S. Patent No. 6,156,452 to Kozuki et al.

Claim 6 has been rejected under 35 U.S.C. § 103(a) as being obvious based on the disclosure of the aforementioned Hornberger et al. patent in view of the disclosure of U.S. Patent No. 4,957,421 to Baldi.

Claims 3 and 13 to 16 have been rejected under 35 U.S.C. § 103(a) as being obvious based on the disclosure of the aforementioned Hornberger et al. patent in view of the disclosure of U.S. Patent No. 3,998,779 to Baer and the disclosure of the "accompanying" Data Sheet.

Claims 17 and 18 have been rejected under 35 U.S.C. § 103(a) as being obvious based on the disclosure of the aforementioned Hornberger patent in view of the disclosure of the aforementioned Baer patent and further in view of the disclosure of U.S. Patent No. 3,180,746 to Stich et al.

Summary of Applicants' Invention

Applicants' invention relates to an environmentally friendly, chromium-free (Cr-free) coating composition which is capable of forming a corrosion-resistant, Cr-free coating on a metallic surface. The composition can be used to excellent advantage to form coatings which protect the underlying surface from the most severe conditions, for example, the surface of a turbine engine which can be exposed to temperatures as high as 2200°F or higher. See, for example, the test results of Example 1 which show that a

steel surface coated in accordance with the present invention withstood 2000 hours of salt spray testing with no signs of corrosion, as evaluated by the standard ASTM B-117 salt spray test (see page 16 of the present application). The test results show also other excellent properties of the coating, including properties of adherence and flexibility, abrasion-resistance and hydrolytic stability.

Applicants' invention is defined by various claim forms including:

- (A) independent process Claims 1, 12 and 19;
- (B) coated article Claims 7 to 11; and
- (C) coating composition Claims 13 to 18.

Each of applicants' claims defines either a coating composition which is capable of forming a corrosion-resistant coating and which is Cr-free or an article having thereon a coating which is corrosion-resistant and Cr-free, or a process for forming a corrosion-resistant, Cr-free coating from a coating composition which is Cr-free.

It is submitted respectfully that the following discussion shows that applicants' claims define novel and non-obvious subject matter.

Discussion of the Examiner's Rejections

Each of the Examiner's rejections is discussed below.

The Section 102(a) Rejection

The Examiner's anticipatory rejection based on the disclosure of the aforementioned Hornberger et al. patent is traversed respectfully.

The Hornberger et al. patent discloses a coating composition and a coating formed therefrom which are the antithesis of the composition and coating defined in applicants' claims. This reference discloses a coating composition which contains a fugitive material that "leaves" the coating formed from the composition and, as it does, it leaves behind a porous coating. This reference is all about the formation of a porous

coating which permits readily the passage therethrough of moisture and other materials which are capable of corroding or otherwise degrading the surface of the underlying substrate. Accordingly, the Hornberger et al. patent does not disclose a coating composition which is capable of forming a corrosion-resistant coating. This reference discloses that the coating composition described therein is useful for forming porous coatings on metallic surfaces used in heat transfer applications to improve the transfer of heat (see the reference, column 1, the paragraph bridging columns 1 and 2 and continuing in column 2 through line 46).

Applicants' claims define novel subject matter in that the coating composition is characterized as being capable of forming a corrosion-resistant coating and the coating is defined as being corrosion-resistant. The Hornberger et al. composition is not capable of forming such a coating and the porous coating formed therefrom is, of course, not corrosion-resistant.

Applicants' claims distinguish further over the reference in defining the composition as "consisting essentially of" the stated ingredients. Pursuant to MPEP §2111.03 (REV. 6, SEPT. 2007, pages 2100-43 to 2100-45, copies forwarded herewith), the transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention, citing *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). Here, the "reference" coating composition containing the fugitive material forms a porous coating and it is the fugitive material that is responsible for forming the porous coating. The incorporation of the fugitive material in a coating composition that would be otherwise effective in forming a corrosion-resistant coating changes materially the properties of the coating composition. Accordingly, the composition defined in applicants' claims exclude from their scope the presence of a "fugitive material" as disclosed in the reference.

It is requested respectfully that the Examiner's Section 102 rejections be withdrawn.

Discussion of the Section 103 Rejections

Each of the Examiner's four obvious rejections involving variously Claims 5, 6, 3 and 13 to 16, and 17 and 18 is traversed respectfully. A common aspect of the Examiner's obvious rejections is that the disclosure of the primary reference (the aforementioned Hornberger et al. patent) can be modified, based on information in the secondary references, in a manner such as to produce the subject matter of applicants' claims. Inasmuch as: (A) the development described in the primary reference involves exclusively the formation of a porous coating from a composition that contains a fugitive material; and (B) none of the secondary references: (i) discloses a development which involves the formation of a porous coating; or (ii) contains a disclosure that would lead one skilled in the art to modify the composition of the primary reference by removing therefrom the fugitive material, it is evident that there is no logical basis for combining the disclosures of the primary and secondary references, as the Examiner has done; even if combined, the subject matter of applicants' claims would not be defined.

Rejection of Process Claim 5

Claim 5 defines a process in which applicants' wet coating is dried under conditions which form a non-conductive solid coating that is thereafter converted to a conductive coating by burnishing. The step of burnishing involves compressing the aluminum particles in the solid coating into more intimate contact with one another; it can be accomplished, for example, by blasting the coating with a material such as glass beads.

Inasmuch as the primary reference does not disclose the burnishing step, the Examiner has cited the aforementioned Kozuki et al. patent for its disclosure of bonding metals by the use of vacuum brazing and ultrasonic welding. Let it at once be

understood that the secondary reference is referring to a welding (brazing) operation which is used to bond two different types of metals together and which involves melting the involved metals. The Examiner's attention is directed to the Kozuki et al. patent, beginning at column 3, line 54 and continuing to line 46 in column 5. The Examiner has equated erroneously applicants' burnishing step with the welding/brazing operation of the secondary reference; however, it is clear that these two operations are not equivalent, if for no other reason than applicants' burnishing step would not be effective in combining two different metals in the manner described in the Kozuki et al. patent. Applicants' burnishing step compresses the aluminum particles into more intimate contact with one another; it is not a welding or brazing operation.

The primary reference discloses a brazing operation that involves combining four sheets of coated aluminum by heating to 1150°F and recovering the sheets in a layered structure; this is not a burnishing operation.

Furthermore, the coated sheets are porous (see the primary reference, column 13, lines 24 to 29). The combined disclosures of the reference do not result in the subject matter of applicants' claims. Accordingly, the rejection should be withdrawn.

Rejection of Process Claim 6

Claim 6 defines a process for forming a corrosion-resistant, electrically conductive coating on the metallic surface of a turbine engine, typically an article which is exposed to severe service conditions that can cause devastating corrosion and degradation of the metal comprising the engine. The Examiner's rejection is based on the position that it would be obvious to apply the coatings of Hornberger et al. to the engine parts disclosed in the Baldi patent and thereby arrive at the subject matter of applicants' Claim 6. But this is incorrect because the coating applied to the engine would not be corrosion-resistant – it would be porous and subject to the unimpeded flow of moisture and/or other degrading material for contact with and destruction of the underlying metallic surface.

It is requested respectfully that the present rejection be withdrawn because the combined disclosures of the references do not result in the formation of a corrosion-resistant coating on the metallic surface of an engine part.

Rejection of Claims 3 and 13 to 16

Claim 3 defines a process in which applicants' wet coating is dried under conditions which form a solid, electrically conductive, corrosion-resistant coating. This can be done, for example, by curing the coating at a temperature of about 1000°F for about one hour. Claims 13 to 16 define an aqueous composition which contains an alkali metal silicate, solid aluminum particles dispersed in the aqueous phase of the composition, and an additive for improving the corrosion-resistance of the coating, for example, an organo functional silane.

The aforementioned claims have been rejected as being obvious based on the disclosure of the Hornberger et al. patent in view of the disclosures of the aforementioned Baer patent and the "accompanying" Data Sheet. These rejections are traversed.

As to process Claim 3 and the conditions disclosed in the Baer patent for forming electrically conductive coatings, it should be understood that the "Baer" coatings are formed from coating compositions that are different from the composition defined in applicants' claims; for example, the dispersed solid metallic particles are different. Baer discloses that if the coating which is formed is not intrinsically electrically conductive, the coating composition should be modified by adding thereto another electrically conductive material, for example, carbon black, carbonyl nickel or iron powder. (See the Baer patent, column 5, lines 10 to 27). In contrast, applicants teach the use of a relatively high temperature to produce directly an electrically conductive coating, for example, at least about 950°F (see the paragraph bridging pages 10 and 11 of the application). Note the reference in the Baer patent to column 7 and the curing of the coating at 300°F to produce directly an electrically conductive coating. Please compare

this disclosure with that of applicants' disclosure on page 10, last complete paragraph, where reference is made to non-electrically conductive coatings which were cured at relatively low temperatures, for example, about 250°F to about 600°F. According to Baer, such coatings would be made electrically conductive by adding to the coating composition another electrically conductive material – not by changing the temperature of the curing conditions to a higher temperature.

In any event, using the curing conditions disclosed in Baer in the process described by the primary reference would not result in applicants' claimed subject matter because the Hornberger coating would be porous and not corrosion-resistant.

The withdrawal of the obvious rejection of Claim 3 is requested respectfully.

The Examiner's rejections of independent coating composition Claim 13 and Claims 14 to 16 which are dependent thereon acknowledge that the involved epoxy resin is removed from the coating; this renders the coating porous and, thus, not corrosion-resistant. The disclosure in the "Data Sheet" does not cure the deficiencies of the other references as they apply to the patentability of applicants' claims.

Withdrawal of the obvious rejections of Claims 13 to 16 is requested respectfully.

Rejection of Claims 17 and 18

Claims 17 and 18 define a coating composition which includes a mixture of sodium silicate and lithium silicate, in addition to water and dispersed aluminum particles.

The Examiner has rejected these claims as being obvious based on disclosure of the aforementioned Hornberger et al. patent in combination with disclosures of the aforementioned Baer and Stich et al. patents. The position of the Examiner is that it would be obvious to modify the Hornberger et al. composition by including therein the

Na/Li silicates disclosed in the Stich patent and thereby arrive at applicants' claimed subject matter. Such modification does not convert, however, the Hornberger et al. composition or the use thereof or coatings formed from the composition to a composition which is capable of forming a corrosion-resistant coating. By virtue of the "mandated" presence in the modified Hornberger et al. composition of a fugitive material, coatings formed from the composition would be porous and not corrosion-resistant.

Accordingly, it is requested that the obvious rejection of Claims 17 and 18 be withdrawn.

Applicants request respectfully an early and favorable action.

Respectfully submitted,

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tory, and thus is a limitation of the claim (although the claim was anticipated by prior art that produced sprouts inherently “rich in glucosinolates”).

During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963) (The claims were directed to a core member for hair curlers and a process of making a core member for hair curlers. Court held that the intended use of hair curling was of no significance to the structure and process of making.); *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962) (statement of intended use in an apparatus claim did not distinguish over the prior art apparatus). If a prior art structure is capable of performing the intended use as recited in the preamble, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) (anticipation rejection affirmed based on Board’s factual finding that the reference dispenser (a spout disclosed as useful for purposes such as dispensing oil from an oil can) would be capable of dispensing popcorn in the manner set forth in appellant’s claim 1 (a dispensing top for dispensing popcorn in a specified manner)) and cases cited therein. See also MPEP § 2112 - § 2112.02.

>However, a “preamble may provide context for claim construction, particularly, where ... that preamble’s statement of intended use forms the basis for distinguishing the prior art in the patent’s prosecution history.” *Metabolite Labs., Inc. v. Corp. of Am. Holdings*, 370 F.3d 1354, 1358-62, 71 USPQ2d 1081, 1084-87 (Fed. Cir. 2004). The patent claim at issue was directed to a two-step method for detecting a deficiency of vitamin B₁₂ or folic acid, involving (i) assaying a body fluid for an “elevated level” of homocysteine, and (ii) “correlating” an “elevated” level with a vitamin deficiency. 370 F.3d at 1358-59, 71 USPQ2d at 1084. The court stated that the disputed claim term “correlating” can include comparing with either an unelevated level or elevated level, as opposed to only an elevated level because adding the “correlating” step in the claim during prosecution to

overcome prior art tied the preamble directly to the “correlating” step. 370 F.3d at 1362, 71 USPQ2d at 1087. The recitation of the intended use of “detecting” a vitamin deficiency in the preamble rendered the claimed invention a method for “detecting,” and, thus, was not limited to detecting “elevated” levels. *Id.*

See also *Catalina Mktg. Int’l v. Coolsavings.com, Inc.*, 289 F.3d at 808-09, 62 USPQ2d at 1785 (“[C]lear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.... Without such reliance, however, a preamble generally is not limiting when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention.” Consequently, “preamble language merely extolling benefits or features of the claimed invention does not limit the claim scope without clear reliance on those benefits or features as patently significant.”). In *Poly-America LP v. GSE Lining Tech. Inc.*, 383 F.3d 1303, 1310, 72 USPQ2d 1685, 1689 (Fed. Cir. 2004), the court stated that “a ‘[r]eview of the entirety of the ’047 patent reveals that the preamble language relating to ‘blown-film’ does not state a purpose or an intended use of the invention, but rather discloses a fundamental characteristic of the claimed invention that is properly construed as a limitation of the claim....” Compare *Intirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1294-96, 70 USPQ2d 1780, 1783-84 (Fed. Cir. 2004) (holding that the preamble of a patent claim directed to a “hand-held punch pliers for simultaneously punching and connecting overlapping sheet metal” was not a limitation of the claim because (i) the body of the claim described a “structurally complete invention” without the preamble, and (ii) statements in prosecution history referring to “punching and connecting” function of invention did not constitute “clear reliance” on the preamble needed to make the preamble a limitation).<

2111.03 Transitional Phrases [R-3]

The transitional phrases “comprising”, “consisting essentially of” and “consisting of” define the scope of a claim with respect to what unrecited additional components or steps, if any, are excluded from the scope of the claim.

The transitional term “comprising”, which is synonymous with “including,” “containing,” or “characterized by,” is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Mars Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1376, 71 USPQ2d 1837, 1843 (Fed. Cir. 2004) (“like the term ‘comprising,’ the terms ‘containing’ and ‘mixture’ are open-ended.”). < *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368, 66 USPQ2d 1631, 1634 (Fed. Cir. 2003) (“The transition ‘comprising’ in a method claim indicates that the claim is open-ended and allows for additional steps.”); *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) (“Comprising” is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) (“comprising” leaves “the claim open for the inclusion of unspecified ingredients even in major amounts”). > In *Gillette Co. v. Energizer Holdings Inc.*, 405 F.3d 1367, 1371-73, 74 USPQ2d 1586, 1589-91 (Fed. Cir. 2005), the court held that a claim to “a safety razor blade unit comprising a guard, a cap, and a group of first, second, and third blades” encompasses razors with more than three blades because the transitional phrase “comprising” in the preamble and the phrase “group of” are presumptively open-ended. “The word ‘comprising’ transitioning from the preamble to the body signals that the entire claim is presumptively open-ended.” *Id.* In contrast, the court noted the phrase “group consisting of” is a closed term, which is often used in claim drafting to signal a “Markush group” that is by its nature closed. *Id.* The court also emphasized that reference to “first,” “second,” and “third” blades in the claim was not used to show a serial or numerical limitation but instead was used to distinguish or identify the various members of the group. *Id.*<

The transitional phrase “consisting of” excludes any element, step, or ingredient not specified in the claim. *In re Gray*, 53 F.2d 520, 11 USPQ 255 (CCPA 1931); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) (“consisting of” defined as “closing the claim to the inclusion of materials other than those recited

except for impurities ordinarily associated therewith.”). But see *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1331-32, 70 USPQ2d 1508, 1516 (Fed. Cir. 2004) (holding that a bone repair kit “consisting of” claimed chemicals was infringed by a bone repair kit including a spatula in addition to the claimed chemicals because the presence of the spatula was unrelated to the claimed invention). A claim which depends from a claim which “consists of” the recited elements or steps cannot add an element or step. When the phrase “consists of” appears in a clause of the body of a claim, rather than immediately following the preamble, it limits only the element set forth in that clause; other elements are not excluded from the claim as a whole. *Mannesmann Demag Corp. v. Engineered Metal Products Co.*, 793 F.2d 1279, 230 USPQ 45 (Fed. Cir. 1986). > See also *In re Crish*, 393 F.3d 1253, 73 USPQ2d 1364 (Fed. Cir. 2004) (The claims at issue “related to purified DNA molecules having promoter activity for the human involucrin gene (hINV).” *Id.*, 73 USPQ2d at 1365. In determining the scope of applicant’s claims directed to “a purified oligonucleotide comprising at least a portion of the nucleotide sequence of SEQ ID NO:1 wherein said portion consists of the nucleotide sequence from ... to 2473 of SEQ ID NO:1, and wherein said portion of the nucleotide sequence of SEQ ID NO:1 has promoter activity,” the court stated that the use of “consists” in the body of the claims did not limit the open-ended “comprising” language in the claims (emphases added). *Id.* at 1257, 73 USPQ2d at 1367. The court held that the claimed promoter sequence designated as SEQ ID NO:1 was obtained by sequencing the same prior art plasmid and was therefore anticipated by the prior art plasmid which necessarily possessed the same DNA sequence as the claimed oligonucleotides. *Id.* at 1256 and 1259, 73 USPQ2d at 1366 and 1369. The court affirmed the Board’s interpretation that the transition phrase “consists” did not limit the claims to only the recited numbered nucleotide sequences of SEQ ID NO:1 and that “the transition language ‘comprising’ allowed the claims to cover the entire involucrin gene plus other portions of the plasmid, as long as the gene contained the specific portions of SEQ ID NO:1 recited by the claim[s]” *Id.* at 1256, 73 USPQ2d at 1366.<

The transitional phrase “consisting essentially of” limits the scope of a claim to the specified materials

or steps “and those that do not materially affect the basic and novel characteristic(s)” of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original) (Prior art hydraulic fluid required a dispersant which appellants argued was excluded from claims limited to a functional fluid “consisting essentially of” certain components. In finding the claims did not exclude the prior art dispersant, the court noted that appellants’ specification indicated the claimed composition can contain any well-known additive such as a dispersant, and there was no evidence that the presence of a dispersant would materially affect the basic and novel characteristic of the claimed invention. The prior art composition had the same basic and novel characteristic (increased oxidation resistance) as well as additional enhanced detergent and dispersant characteristics.). “A ‘consisting essentially of’ claim occupies a middle ground between closed claims that are written in a ‘consisting of’ format and fully open claims that are drafted in a ‘comprising’ format.” *PPG Industries v. Guardian Industries*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also *Atlas Powder v. E.I. duPont de Nemours & Co.*, 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); *In re Janakirama-Rao*, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); *Water Technologies Corp. vs. Calco, Ltd.*, 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, “consisting essentially of” will be construed as equivalent to “comprising.” See, e.g., *PPG*, 156 F.3d at 1355, 48 USPQ2d at 1355 (“PPG could have defined the scope of the phrase ‘consisting essentially of’ for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel characteristics of the invention.”). See also *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1240-41, 68 USPQ2d 1280, 1283-84 (Fed. Cir. 2003) (Applicant’s statement in the specification that “silicon contents in the coating metal should not exceed about 0.5% by weight” along with a discussion of the deleterious effects of silicon provided basis to conclude that silicon in excess of 0.5% by weight would materially alter the basic and novel properties of the invention. Thus, “consisting

essentially of” as recited in the preamble was interpreted to permit no more than 0.5% by weight of silicon in the aluminum coating.); *In re Janakirama-Rao*, 317 F.2d 951, 954, 137 USPQ 893, 895-96 (CCPA 1963). If an applicant contends that additional steps or materials in the prior art are excluded by the recitation of “consisting essentially of,” applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant’s invention. *In re De Lajarte*, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). See also *Ex parte Hoffman*, 12 USPQ2d 1061, 1063-64 (Bd. Pat. App. & Inter. 1989) (“Although ‘consisting essentially of’ is typically used and defined in the context of compositions of matter, we find nothing intrinsically wrong with the use of such language as a modifier of method steps. . . [rendering] the claim open only for the inclusion of steps which do not materially affect the basic and novel characteristics of the claimed method. To determine the steps included versus excluded the claim must be read in light of the specification. . . . [I]t is an applicant’s burden to establish that a step practiced in a prior art method is excluded from his claims by ‘consisting essentially of’ language.”).

OTHER TRANSITIONAL PHRASES

Transitional phrases such as “having” must be interpreted in light of the specification to determine whether open or closed claim language is intended. See, e.g., *Lampi Corp. v. American Power Products Inc.*, 228 F.3d 1365, 1376, 56 USPQ2d 1445, 1453 (Fed. Cir. 2000) (The term “having” was interpreted as open terminology, allowing the inclusion of other components in addition to those recited); *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l Inc.*, 246 F.3d 1336, 1348, 57 USPQ2d 1953, 1959 (Fed. Cir. 2001) (term “having” in transitional phrase “does not create a presumption that the body of the claim is open”); *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1573, 43 USPQ2d 1398, 1410 (Fed. Cir. 1997) (In the context of a cDNA having a sequence coding for human PI, the term “having” still permitted inclusion of other moieties.). The transitional phrase “composed of” has been interpreted in the same manner as either “consisting of” or “consisting essentially of,” depending on the facts of the particular case. See *AFG Indus-*